

Shock Hazard Prevention through Self-Healing Insulative Coating on SSA Metallic Bearings, Phase I

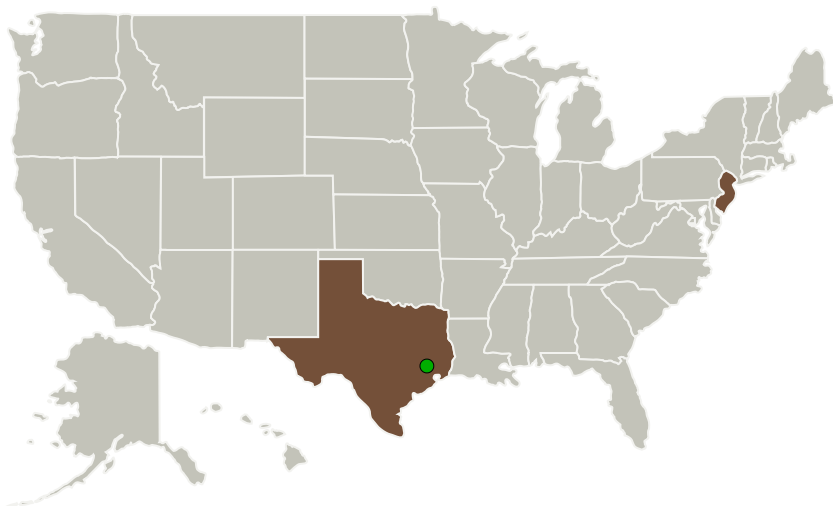
Completed Technology Project (2014 - 2014)



Project Introduction

The space suit contains metallic bearings at the wrist, neck, and waist, which are exposed to the space environment. There is a need to maintain a high degree of insulation on the surface of the metallic bearings. Current methods to preserve the insulation feature include the use of anodized coatings and polyimide films. However, they are easily damaged and are hard to replace or repair. Innovations are needed to provide a protection method that is easy to maintain. Working with a developer and supplier of systems to NASA, we propose to demonstrate the feasibility of a self-healing insulative polymer coating on the metallic parts that will allow the coating to repair damages under normal operational conditions of the spacesuit. The self-healing capability is afforded through a novel polymer morphology. In Phase I, we will coat 17-4 PH stainless steel flat panels, test coating properties, and evaluate the self-healing performance under near ambient temperatures. In Phase II, the self-healing coating will be applied on a prototype metallic bearing and the coating composition and morphology will be optimized so that it meets all the functional performance requirements. A functioning prototype metallic bearing will be delivered to NASA. The goal is to achieve TRL 6 by the end of the Phase II program.

Primary U.S. Work Locations and Key Partners



Shock Hazard Prevention through Self-Healing Insulative Coating on SSA Metallic Bearings Project Image

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Organizations Performing Work	Role	Type	Location
NEI Corporation	Lead Organization	Industry Small Disadvantaged Business (SDB)	Piscataway, New Jersey
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations

New Jersey	Texas
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Project Transitions

**June 2014:** Project Start**December 2014:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/140546>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

NEI Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Runqing Ou

Co-Investigator:

Runqing Ou

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Images



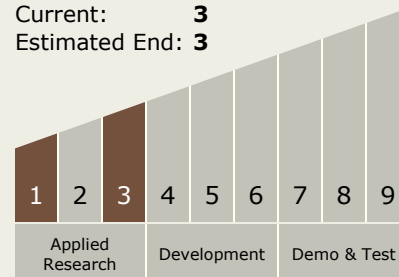
Project Image

Shock Hazard Prevention through Self-Healing Insulative Coating on SSA Metallic Bearings Project Image

(<https://techport.nasa.gov/image/127694>)

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - TX06.2 Extravehicular Activity Systems
 - TX06.2.1 Pressure Garment

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System